Docket No.: 392.1831

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Atsushi WATANABE

Serial No. 10/692,801 Group Art Unit: 3652

Confirmation No. 1084

Filed: October 27, 2003 Examiner: Charles N. Greenhut

For: OBJECT CONVEYING SYSTEM AND CONVEYING METHOD

APPELLANT'S BRIEF UNDER 37 C.F.R. § 41.37

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In a Notice of Appeal filed May 18, 2007, the applicants appealed the Examiner's February 20, 2007, Office Action finally rejecting claims 1-46. Therefore, an Appellant's Brief is due July 18, 2007. Appellant's Brief together with the requisite fee set forth in 37 CFR § 41.20, is submitted herewith.

I. REAL PARTY IN INTEREST

The real party in interest is FANUC LTD, the assignee of the subject application.

II. RELATED APPEALS AND INTERFERENCES

Appellant, appellant's legal representative, and the assignee do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by, or have a bearing on, the Board's decision in this appeal.

III. STATUS OF CLAIMS

Appealed claims 1-46 have been rejected and are on appeal.

IV. STATUS OF AMENDMENTS

The last Amendment submitted in the present application was filed on December 5, 2006 and was entered and considered as evidenced by the final Office Action mailed on February 20, 2007. No further amendments have been submitted.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 recites an object conveying system for conveying objects from a first process to a second process. A first robot (30) has an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm. The hand (50) holds and takes out a container (70 or 71) containing objects (W) positioned therein from the first process and conveys and positions the held container (70 or 71) using the arm to a predetermined position. A second robot (1) holds and takes out an object (W) contained in the container (70 or 71) held by the hand (50) of the first robot (30) and conveys the held object (W) to the second process. The predetermined position is within an operation range of the second robot (1).

Independent claim 2 recites an object conveying system for conveying objects from a first process to a second process. A first robot (30) has an articulated arm (e.g. figure 2) and a hand (50) at a distal end of the arm. The hand (50) holds and takes out a container (70 or 71) containing objects (W) from the first process and conveys and positions the held container (70 or 71) using the arm to a predetermined position. A second robot (1) with a sensor (10) holds and takes out an object (W) contained in the container (70 or 71) held by the hand (50) of the first robot (30) by recognizing a position and/or an orientation of the object using the sensor (10) and conveys the held object (W) to the second process. The predetermined position is within an operation range of the second robot (1).

Independent claim 12 recites an object conveying system for conveying objects from a first process to a second process. A first robot (30) has an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm. The hand (50) holds and takes out a container (70 or 71) from the second process, and carries and positions the held container (70 or 71) using the arm to a predetermined position. A second robot (1) sequentially holds and takes out objects (W) from the first process and places the objects (W) in the container (70 or 71) held by the hand (50) of the first robot (30) according to a predetermined pattern. The hand (50) of the first robot (30) conveys the container (70 or 71) in which the objects (W) are placed to the second process.

Independent claim 13 recites an object conveying system for conveying objects from a first process to a second process. A first robot (30) has an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm. The hand (50) holds and takes out a container (70 or 71) from the second process, and carries and positions the held container (70 or 71) using the arm

to a predetermined position. A second robot (1) with a sensor (10) that sequentially holds and takes out objects (W) from the first process and places the objects (W) in the container (70 or 71) held by the hand (50) of the first robot (30) by recognizing a position at which the object is to be placed using the sensor (10). The hand (50) of the first robot (30) conveys the container (70 or 71) in which the objects (W) are placed to the second process.

Independent claim 24 recites an object conveying method for conveying objects from a first process to a second process. One step of the method is to hold and take out a container (70 and 71) containing objects (W) positioned therein from the first process (see Figure 3, A1). Another step is to convey and position the held container (70 or 71) to a predetermined position within an operation range of a second robot (1) by using a first robot (30) that has an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm (see Figure 3, A3). Still another step is to hold and take out an object (W) contained in the container (70 or 71) held by the first robot (30) and then to convey the held object (W) to the second process using the second robot (1) (see Figure 3, A15).

Independent claim 25 recites an object conveying method for conveying objects from a first process to a second process. One step of the method is to hold and take out a container (70 and 71) containing objects (W) positioned therein from the first process (see Figure 3, A1). Another step is to convey and position the held container (70 or 71) to a predetermined position within an operation range of a second robot (1) by using a first robot (30) that has an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm (see Figure 3, A3). Still another step is to hold and take out an object (W) contained in the container (70 or 71) held by the first robot (30) using a second robot (1) that recognizes a position and/or an orientation of the object (W) using a sensor provided at the second robot (1) and then to convey the held object (W) to the second process by the second robot (1) (see Figure 3, A15).

Independent claim 35 recites an object conveying method for conveying objects from a first process to a second process. One step of the method is to hold and take out a container (70 or 71) from the second process (see Figure 6, C1). Another step is to convey and position the held container (70 or 71) at a predetermined position using a first robot (30) having an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm (see Figure 6, C3). Another step is to sequentially hold and take out objects (W) from the first process and place the

objects in the container (70 or 71) held by the first robot (30) according to a predetermined pattern, using a second robot (1) (see Figure 6, C15). Still another step is to convey the container (70 or 71) in which the objects (W) are placed to the second process by the first robot.

Independent claim 36 recites an object conveying method for conveying objects from a first process to a second process. One step of the method is to hold and take out a container (70 or 71) from the second process (see Figure 10, E3). Another step is to convey and position the held container (70 or 71) at a predetermined position using a first robot (30) having an articulated arm (e.g. Figure 2) and a hand (50) at a distal end of the arm (see Figure 10, E4). Another step is to sequentially hold and take out objects (W) from the first process and place the objects in the container (70 or 71) held by the first robot (30) using a second robot (1) that recognizes a position at which the object is to be placed using a sensor (10) provided at the second robot (1) (see Figure 10, E6). Still another step is to convey the container (70 or 71) in which the objects (W) are placed to the second process by the first robot.

None of the claims contain an element expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-46 were rejected under 35 USC 112, second paragraph, as being indefinite. Specifically, claims 1, 2, 12, 13, 24, 25, 35 and 36 were held indefinite because of the phrase "container containing objects positioned therein from the first process." This ground of rejection is not addressed in the present Appeal.

Claims 1, 2, 12 and 13 were further held to be indefinite under 35 USC 112, second paragraph, because the Examiner has held that these claims include process steps in apparatus claims. This ground of rejection is addressed in the present Appeal and review is respectfully requested.

Claims 1-46 were rejected under 35 USC 102(b) as being anticipated by Nelson et al. (US 6,723,174). This ground of rejection is addressed in the present Appeal and review is respectfully requested.

VII. ARGUMENT

A. Review of the Prior Art – Nelson et al. (US 6,723,174)(hereinafter "Nelson")

Nelson discloses an automated semiconductor processing system. In one embodiment of Nelson, at each pallet position, an optical sensor 72 detects the presence or absence of a pallet 710 via detecting the presence or absence of reflected light. In addition, at each pallet position A-J, the x-axis sensor pair 690 detects the presence or absence of a cassette 88. Specifically, the infrared transmitter 692 projects a light beam vertically upwardly. The light beam passes through the x-axis transmitter prism 714, on each pallet 710, which bends the light beam 90 degrees, so that the light beam is then projected horizontally inwardly towards the x-axis detector prism 716. If a cassette 88 is present on the pallet 710, the light beam will be blocked by the cassette 88, and the x-axis detector 694 will not detect any infrared light, indicating presence of a cassette 88. On the other hand, if the pallet 710 has no cassette 88 on it, infrared light from the transmitter 692 passes through the x-axis transmitter prism 714, passes over the pallet 710, and is redirected downwardly by the x-axis detector prism 716, so that the infrared light is directed to and detected by the x-axis infrared detector 694, indicating the absence of a cassette 88. Nelson, 14:18-14:40 and Figure 31.

In Nelson, an engager plate 910 is positioned on an engager actuator 912 that moves the engager plate 910 longitudinally, i.e., in a direction from the front wall 806 to the back wall 810, and perpendicular to those walls. Nelson, 17:14-17:18 and Figure 34.

Further in Nelson, a docking wall 914 at the docking station 828 and a deck 932 separate the indexer space 820 from the process space 822. The docking wall 914 has openings 916 and 918 aligned with the pod positions T and U. Hence, a pod door 816 of a pod 815 on an engager plate 910 lifted to a pod position T or U by a docking elevator 900, aligns laterally and vertically (but initially not longitudinally) with an opening 916 or 918 in the docking wall 914. After the pod 815 is vertically aligned with an opening 914 or 916, the engager actuator 912 moves the pod forward, so that the front face of the pod contacts the docking wall 914. During other movement of the pod 815 on the elevator 900, the engager actuator 912 is retracted, so that the pod is spaced apart from the docking wall 914 and can be moved vertically without interference with the docking wall 914, or other components. Nelson, 17:19-17:34 and Figure 34.

In Nelson, an operator carries a pod 815 to the loader 824. The pod 815 is placed onto the load elevator 838. The elevator 838 lowers the pod from the up or load position 844 to the down or indexer position 846. Wafers 818 are enclosed, and generally sealed within the pod 815, to protect the wafers 818 from contamination and damage during handling and movement. A pod door 816 closes or seals off the open front end of the pod 815. Nelson, 18:30-18:43 and Figures 32, 33 and 35.

With the pod 815 at pod position AA, the conveyor section 850 supporting the pod 815 is actuated. The drive rollers 852 drive the pod 815 rearwardly, while the idler rollers 854 help to support the pod 815, thereby moving the pod 815 from the conveyor section 850 to pod position K in the indexer 826. The drive rollers 852 at position K in the indexer 826 are also actuated to help complete this movement. The conveyor sections 850 are at the same vertical level as the indexer conveyors 864 and 866, as well as the docking elevator conveyors 902. Nelson, 18:44-18:54.

As each subsequent pod 815 is loaded, the drive rollers 852 in the conveyor 864 in the load row 860 of the indexer 826 are actuated. Thus, the pod 815 at pod position K is moved by the conveyor 864 to position L, while the pod at position AA moves into position K. The pod in position L then moves to position M, followed by subsequent pods, and then into position R. The movement of the pod 815 from position M to position R, onto the docking elevator conveyor 902 is performed in the same way as the movement of the pod 815 from position AA to position K, i.e., the drive rollers 852 in the conveyor 864 are actuated in coordination with the drive rollers 852 in the docking elevator conveyor. Nelson, 18:57-19:4.

The elevator 900 then lifts the pod 815 off of the conveyor 902 and raises the pod vertically up to the docking station 828. Once the pod 815 is raised to the level of the docking station 828, the engager actuator 912 moves the pod 815 forward, so that the front surface of the pod contacts the docking wall 914, to dock the pod. The pod door remover 930 engages the pod door 816 through the opening 916 in the docking wall 914. Suction cups on the pod door remover 930 hold the pod door 816 onto the pod door remover 930, while keys extend into the pod door 816 and rotate, to unlock or release the latching mechanism that holds the pod door 816 onto the pod 815. The pod door remover 930 then moves forward, carrying the pod door 816 with it through the opening 916. The pod door remover 930, carrying the pod door 816 then

moves down through the door slot 934. The front of the pod 815 is then opened to the process space 822. Nelson, 19:5-19:23.

The transfer robot 970 in the transfer station 830 moves so that the end effector 976 on the articulated arm 974 moves through the opening 916 to engage a wafer 818 within the pod 815. The robot 970 withdraws the wafer 818 from the pod 815 and places the wafer into the carrier 990. The robot 970 may pass the wafer over a scanner 980 to allow the controller to identify the wafer. Nelson, 19:24-19:30. and Figure 33.

The transfer robot 970 transfers wafers between the pod 815 in row CC and the carrier 990 in row CC which is aligned with that pod, in the longitudinal direction. The transfer robot 970 continues transferring wafers from the docked pod 815 to the carrier 990, until all wafers have been transferred from the pod 815. Nelson, 19:33-19:44.

With the carrier 990 now loaded with wafers 818, the process robot 1000 moves to engage the loaded carrier 990. The robot 1000 moves laterally on the rail 1002 so that the robot arm 1004 is adjacent to the carrier 990. The arm 1004 then moves vertically down, with the fingers 1006 engaging into the slots 1007 of the carrier 990. The robot arm 1004 then lifts the carrier 990 off of the deck 932, pivots the carrier 990 clockwise, moves the carrier 990 forward (towards the front wall 806) and then moves the carrier 990 laterally along the rail 1002, to a position in alignment with the rotor 1040 in one of the process chambers 1020 or 1030. Nelson, 19:46-19:67 and Figures 43, 44 and 45.

After the door of the process chamber 1020 or 1030 is open, the robot 1000 moves the carrier 990 into engagement with the rotor 1040. The securing device 1008 is released or withdrawn, the arm 1004 is pulled back out of the chamber 1020 or 1030, the chamber door is closed, and the wafers 818 are processed. Nelson, 20:1-20:8 and Figures 46, 47 and 48.

B. Claims 1-46 are patentable over Nelson et al. (US 6,723,174)

In the final Office Action, the Examiner rejected claims 1-46 as being anticipated by Nelson.

i. Independent claims 1, 2, 12, 13, 24, 25, 35 and 36 are not anticipated by Nelson.

As the independent claims stand or fall together, the Appellant's argument is focused

solely on the rejection of claim 1. Claim 1 recites: "...a first robot having an articulated arm and a hand at a distal end of the arm, said hand holding and taking out a container containing objects positioned therein from the first process and conveying and positioning the held container using said arm to a predetermined position...."

In contrast to claim 1, Nelson does not discuss a robot having an articulated arm. The Office Action relies on the engager actuator 912 of Nelson to supply this feature of claim 1. The engager actuator 912 of Nelson moves an engager plate 910 longitudinally. That is, the engager actuator 912 only can move in a direction from the front wall 806 to the back wall 810, in a line perpendicular to those walls. By contrast, claim 1 recites an articulated arm.

Claim terms carry their ordinary meaning unless it appears that the inventor used them differently. In the present application, the term "articulated" is given its ordinary meaning which is: "an arm united by a joint or joints." See Random House Unabridged Dictionary, Random House, Inc. 2006. Figures 1, 2 and 5 show the articulated arm of the present application. Further, the specification of the present application describes the robot 1 as being articulated at page 11, line 17.

The Examiner acknowledged the difference between the articulated arm of the present invention as discussed in the specification and the elevator/engager actuator of Nelson, but held that the limitations of the specification could not be read into the claims. It is respectfully submitted that the term "articulated arm" is in claim 1 and patentably distinguishes over the engager actuator 912 since the articulated arm is jointed in contrast to the engager actuator 912 which is only capable of moving the pod 815 in one direction from a back wall to a front wall. Figure 34 of Nelson, showing engager actuator 912, clearly does not show articulation.

The Examiner further stated that the engager actuator 912 of Nelson is articulated within the broadest reasonable interpretation of that term. However, it is respectfully submitted that the Examiner only considered the term "articulated" rather than "articulated arm."

The ordinary meaning of the term "arm," in the context of the present application is: "a part similar to a human arm, such as the forelimb of an animal or a long part projecting from a central support in a machine." See The American Heritage Dictionary of the English Language, Fourth Edition, Houghton Mifflin Company, 2004. A sliding joint is not included in a human or animal arm. In view of the foregoing, it is respectfully submitted that the broadest reasonable

interpretation of the term "articulated arm" would not be anticipated by an engager actuator including 912 including a sliding joint. To anticipate the term "articulated arm" it is respectfully submitted that an arm would require at least a joint capable of pivotal movement such as in a human arm.

In view of the foregoing, it is respectfully submitted that Nelson does not discuss a robot having an articulated arm as recited in claim 1. It is further respectfully submitted that claims 2-46 also patentably distinguish over Nelson based on having identical features to claim 1 or their dependency on an allowable base claim.

ii. Nelson does not anticipate claims 6, 17, 29 and 40

In the final Office Action, dependent claims 6, 17, 29 and 40 were rejected based on 14:41-14:58 of Nelson. As the dependent claims 6, 17, 29 and 40 contain similar features, they stand or fall together. Accordingly, the Appellant's argument is focused solely on the rejection of claim 6. Claim 6 recites: "...when the object is taken out from the container, a signal indicating the number of objects taken out from the container or the number of objects remaining in the container is output to outside of the system."

In Nelson, a y-axis sensor pair 696 detects the presence or absence of wafers in the cassette 88. If a wafer (corresponding to the object of claim 6) is in the cassette 88 (corresponding to the container of claim 6), the bottom edge of the wafer projects downwardly through the tunnel 725, preventing light from passing through the tunnel. The presence of any wafer in the cassette 88 will block the light from a y-axis transmitter 698, so that the y-axis detector 700 detects no light, indicating presence of at least one wafer in the cassette 88. As such, Nelson does not disclose a signal indicating the number of wafers taken out from the cassette as recited in claim 6 but rather a transmitter only capable of determining if one or more wafers is present in the cassette.

To refute this argument the Examiner stated that the discussion in Nelson where a y-axis sensor pair 696 detects the presence or absence of wafers in the cassette 88 is within the broadest reasonable interpretation of claim 6. Claim 6 recites a signal indicating a number of objects. Nelson discusses a sensor that will send the same signal if one or twenty wafers are in the cassette 88. As Nelson does not discuss a signal indicating a number of objects, it is respectfully submitted that Nelson does not anticipate claim 6. Similarly, it is respectfully

submitted that dependent claims 17, 29 and 40 also patentably distinguish over Nelson.

C. Claims 1, 2, 12 and 13 are not improperly attempting to include process steps in an apparatus claim.

In the final Office Action, Claims 1, 2, 12 and 13 were rejected as indefinite under 35 USC 112, second paragraph, because the Examiner has taken the position that these claims include process steps in apparatus claims. To the contrary, it is respectfully submitted that claims 1, 2, 12 and 13 do not contain process steps but rather contain functional language. It is well established that it is permissible to include functional language in apparatus or system claims. Claims 1, 2, 12 and 13 clearly recite object conveying systems.

See, for example, MPEP 2173.05(g): "A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)."

See also, for example, MPEP 2173.05(p): "There are many situations where claims are permissively drafted to include a reference to more than one statutory class of invention." As an example of when an apparatus claim including process steps may be held to be indefinite, MPEP 2173.05(p) further notes: "A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 USC 112, second paragraph. IPXL Holdings v. Amazon.com, Inc., 430 F.2d 1377, 1384, 77 USPQ2d 1140, 1145 (Fed. Cir. 2005); Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990) (claim directed to an automatic transmission workstand and the method of using it held ambiguous and properly rejected under 35 USC 112, second paragraph.)" Although functional language is included in each of the claim elements, all of the elements of claims 1, 2, 12 and 13 are clearly elements of a system rather than method steps. For example, claim 1 recites a first robot and a second robot.

Furthermore, in accordance with In re Zurko, 111 F.3d 887, 42 USPQ2d 1476 (Fed. Cir. 1997), a specific function is sufficient to patentably distinguish over the prior art.

In view of the foregoing, it is respectfully submitted that claims 1, 2, 12 and 13 meet the requirements of 35 USC 112, second paragraph.

D. Conclusion

In summary, the Appellant submits that claims 1-46 patentably distinguish over the prior art and further that claims 1, 2, 12 and 13 do not improperly include process steps in apparatus claims. Reversal of the Examiner's rejections is respectfully requested.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

1. (PREVIOUSLY PRESENTED) An object conveying system for conveying objects from a first process to a second process, comprising:

a first robot having an articulated arm and a hand at a distal end of the arm, said hand holding and taking out a container containing objects positioned therein from the first process and conveying and positioning the held container using said arm to a predetermined position; and

a second robot holding and taking out an object contained in the container held by said hand of said first robot and conveying the held object to the second process, said predetermined position being within an operation range of said second robot.

2. (PREVIOUSLY PRESENTED) An object conveying system for conveying objects from a first process to a second process, comprising:

a first robot having an articulated arm and a hand at a distal end of the arm, said hand holding and taking out a container containing objects from the first process and conveying and positioning the held container using said arm to a predetermined position; and

a second robot with a sensor, said second robot holding and taking out an object contained in the container held by said hand of said first robot by recognizing a position and/or an orientation of the object using the sensor, and conveying the held object to the second process, said predetermined position being within an operation range of said second robot.

3. (ORIGINAL) An object conveying system according to claim 1, wherein said first robot changes a position and/or an orientation of the held container for taking out of the object by said second robot.

4. (ORIGINAL) An object conveying system according to claim 2, wherein said first robot changes a position and/or an orientation of the held container, for holding and taking out of an object by said second robot and/or for recognizing of the position and/or the orientation of the object using the sensor.

5. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein said first robot has a sensor mounted thereon, and holds the container based on a position of the container detected by the sensor.

6. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein when the object is taken out from the container, a signal indicating the number of objects taken out from the container or the number of objects remaining in the container is output to outside of the system.

7. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein when the object is taken out from the container, a signal is output to outside of the system, if the number of objects taken out from the container or the number of objects remaining in the container satisfies a predetermined comparison condition.

8. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein said second robot notifies said first robot that said second robot holds the object in taking out the object.

9. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein said second robot notifies the second process that said second robot holds the object or that said second robot reaches such a region that the second process has to start to make a preparation, in taking out the object.

10. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein said second robot takes out the object from the container, and conveys the taken object to a temporary placing table on which the taken object is temporally placed.

11. (ORIGINAL) An object conveying system according to claim 1 or 2, wherein said first robot changes a position and/or an orientation of the held container so as to assist said second robot to eliminate an abnormality which is unable to be eliminated by the second robot in taking out the object from the container.

12. (PREVIOUSLY PRESENTED) An object conveying system for conveying objects from a first process to a second process, comprising:

a first robot having an articulated arm and a hand at a distal end of the arm, said hand holding and taking out a container from the second process, and carrying and positioning the held container using said arm to a predetermined position; and

a second robot sequentially holding and taking out objects from the first process and placing the objects in the container held by said hand of said first robot according to a predetermined pattern,

wherein said hand of said first robot conveys the container in which the objects are placed to the second process.

13. (PREVIOUSLY PRESENTED) An object conveying system for conveying objects from a first process to a second process, comprising:

a first robot having an articulated arm and a hand at a distal end of the arm, said hand holding and taking out a container from the second process, and conveying and positioning the held container using said arm to a predetermined position; and

a second robot with a sensor, said second robot sequentially holding and taking out objects from the first process and placing the objects in the container held by said hand of said first robot by recognizing a position at which the object is to be placed using the sensor,

wherein said hand of said first robot conveys the container in which the objects are placed to the second process.

14. (ORIGINAL) An object conveying system according to claim 12, wherein said first robot changes a position and/or an orientation of the held container for placing of the object in the container by the second robot.

15. (ORIGINAL) An object conveying system according to claim 13, wherein said first robot changes a position and/or an orientation of the held container for placing of the object in the container by said second robot and/or recognizing of the position in the container at which the object is to be placed using the sensor.

16. (ORIGINAL) An object conveying system according to claim 12 or 13, wherein said first robot has a sensor mounted thereon, and conveys the container to the second process by recognizing a position at which the container is to be stored using the sensor.

17. (ORIGINAL) An object conveying system according to claim 12 or 13, wherein when the object is placed in the container, a signal indicating the number of objects placed in the container or the number of objects remaining in the container is output to outside of said system.

18. (ORIGINAL) An object conveying system according to claim 12 or 13, wherein when the object is placed in the container, a signal is output to outside of the system, if the number of objects placed in the container or the number of objects remaining in the container satisfies a predetermined comparison condition.

19. (ORIGINAL) An object conveying system according to claim 12 or 13, wherein said second robot notifies said first robot that the object has been placed in the container.

20. (ORIGINAL) An object conveying system according to claim 12 or 13, wherein said second robot takes out an object from a temporary placing table on which the object is temporally placed, and places the object in the container held by said first robot.

21. (ORIGINAL) An object conveying system according to claim 12 or 13, wherein said first robot changes a position and/or an orientation of the held container so as to assist said second robot to eliminate an abnormality which is unable to be eliminated by the second robot in placing the object in the container.

22. (PREVIOUSLY PRESENTED) An object conveying system according to claim 2 or 13, wherein the sensor comprises a visual sensor.

23. (PREVIOUSLY PRESENTED) An object conveying system according to claim 2 or 13, wherein the sensor comprises a three-dimensional position sensor.

24. (PREVIOUSLY PRESENTED) An object conveying method for conveying objects from a first process to a second process, comprising the steps of:

holding and taking out a container containing objects positioned therein from the first process, and conveying and positioning the held container to a predetermined position within an operation range of a second robot, using a first robot having an articulated arm and a hand at a distal end of the arm; and

holding and taking out an object contained in the container held by the first robot, and conveying the held object to the second process using the second robot.

25. (PREVIOUSLY PRESENTED) An object conveying method for conveying objects from a first process to a second process, comprising the steps of:

holding and taking out a container containing objects from the first process, and conveying and positioning the held container to a predetermined position within an operation range of a second robot, using a first robot having an articulated arm and a hand at a distal end of the arm; and

holding and taking out an object contained in the container held by the first robot using a second robot by recognizing a position and/or an orientation of the object using a sensor provided at the second robot, and conveying the held object to the second process by the second robot.

26. (ORIGINAL) An object conveying method according to claim 24, wherein said step of taking out the object by the second robot includes a step of changing a position and/or an orientation of the container held by the first robot.

27. (ORIGINAL) An object conveying method according to claim 25, wherein said step of taking out the object by the second robot by recognizing the position and/or the orientation of the object by the sensor includes a step of changing a position and/or an orientation of the container held by the first robot.

28. (ORIGINAL) An object conveying method according to claim 24 or 25, wherein said

step of taking out the container by the first robot includes a step of holding the container based on a position of the container detected by a sensor mounted on the first robot.

29. (ORIGINAL) An object conveying method according to claim 24 or 25, further including a step of outputting a signal indicating the number of objects taken out from the container or the number of objects remaining in the container when said step of taking out the object from the container by the second robot is performed.

30. (ORIGINAL) An object conveying method according to claim 24 or 25, further including a step of outputting a signal, if the number of objects taken out from the container or the number of objects remaining in the container satisfies a predetermined comparison condition when said step of taking out the object from the container by the second robot is performed.

31. (ORIGINAL) An object conveying method according to claim 24 or 25, wherein said step of taking out the object from the container by the second robot includes a step of notifying said first robot that said second robot holds the object.

32. (ORIGINAL) An object conveying method according to claim 24 or 25, wherein said step of taking out the object from the container by the second robot includes a step of notifying the second process that said second robot holds the object or that said second robot reaches such a region that the second process has to start to make a preparation.

33. (ORIGINAL) An object conveying method according to claim 24 or 25, wherein said step of taking out the object from the container and conveying the object to the second process by the second robot includes a step of conveying the object to a temporary placing table on which the taken object is temporally placed.

34. (ORIGINAL) An object conveying method according to claim 24 or 25, further including a step of changing a position and/or an orientation of the container held by the first robot so as to assist the second robot to eliminate an abnormality which is unable to be eliminate by the second robot in taking out the object from the container.

35. (PREVIOUSLY PRESENTED) An object conveying method for conveying objects from a first process to a second process, comprising:

holding and taking out a container from the second process, and conveying and positioning the held container at a predetermined position using a first robot having an articulated arm and a hand at a distal end of the arm;

sequentially holding and taking out objects from the first process and placing the objects in the container held by said first robot according to a predetermined pattern, using a second robot; and

conveying the container in which the objects are placed to the second process by the first robot.

36. (PREVIOUSLY PRESENTED) An object conveying method for conveying objects from a first process to a second process, comprising:

holding and taking out a container from the second process, and conveying and positioning the held container at a predetermined position using a first robot having an articulated arm and a hand at a distal end of the arm;

sequentially holding and taking out objects from the first process and placing the objects in the container held by said first robot using a second robot by recognizing a position at which the object is to be placed using a sensor provided at the second robot; and

conveying the container in which the objects are placed to the second process by the first robot.

37. (ORIGINAL) An object conveying method according to claim 35, further including a step of changing a position and/or an orientation of the container held by the first robot for placing the object in the container by the second robot.

38. (ORIGINAL) An object conveying method according to claim 36, further including a step of changing a position and/or an orientation of the container held by the first robot for placing the object in the container by the second robot and/or for recognizing the position in the container at which the object is to be placed using the sensor.

39. (ORIGINAL) An object conveying method according to claim 35 or 36, wherein said step of conveying the container to the second process by the first robot includes a step of recognizing a position at which the container is to be stored by a sensor mounted on the first robot.

40. (ORIGINAL) An object conveying method according to claim 35 or 36, further including a step of outputting a signal indicating the number of objects placed in the container or the number of objects remaining in the container when the object is placed in the container.

41. (ORIGINAL) An object conveying method according to claim 35 or 36, further including a step of outputting a signal if the number of objects placed in the container or the number of objects remaining in the container satisfies a predetermined comparison condition when the object is placed in the container.

42. (ORIGINAL) An object conveying method according to claim 35 or 36, further including a step of notifying said first robot that the object has been placed in the container by the second robot.

43. (ORIGINAL) An object conveying method according to claim 35 or 36, further including a step of taking out an object by the second robot from a temporary placing table on which the object is temporally held and placing the object in the container held by the first robot.

44. (ORIGINAL) An object conveying method according to claim 35 or 36, further including a step of changing a position and/or an orientation of the container held by the first robot so as to assist the second robot to eliminate an abnormality which is unable to be eliminate by the second robot in placing the object in the container.

45. (PREVIOUSLY PRESENTED) An object conveying method according to claim 25 or 36 , wherein the sensor comprises a visual sensor.

46. (PREVIOUSLY PRESENTED) An object conveying method according to claim 25 or 36 , wherein the sensor comprises a three-dimensional position sensor.

47. (CANCELLED)

IX. EVIDENCE APPENDIX

Not applicable

X. RELATED PROCEEDING APPENDIX

Not applicable